

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

IN RE APPLICATION OF:

GROUP: 1656

Yoshihiro NOMURA, et al.

SERIAL NO: 10/594,758

EXAMINER: TSAY, M. M.

FILED: September 29, 2006

FOR: PROCESS FOR PRODUCING SOLUBILIZED KERATIN

**DECLARATION UNDER 37 C.F.R. § 1.132**

COMMISSIONER FOR PATENTS  
ALEXANDRIA, VIRGINIA 22313

Sir:

Now comes \_\_\_\_\_Yuuiti Tsuda\_\_\_\_\_ who deposes and states:

1. That I am a graduate of \_Tokyo university of agriculture and technology  
\_\_\_\_\_and received a \_master\_ degree in the year \_2004\_\_.

2. That I have been employed by \_TOYO FEATHER INDUSTRY CO.,LTD\_, for \_5\_  
years as a researcher in the field of \_biochemistry\_\_.

3. That I understand the English language or, at least, that the contents of the  
Declaration were made clear to me prior to executing the same.

4. That the following experiments were carried out by me or under my direct  
supervision and control.

5. The selection of feathers having a water content within the range 20% to 80%  
surprisingly provides a superior method of making keratin from feathers by increasing the  
hydrolysis rate and subsequent yield of keratin.

6. To demonstrate this effect, feathers, used as raw materials for producing keratin by  
hydrolysis, having various water content were prepared. Raw material feathers having a water  
content of 5%, 15%, 20%, 80%, 90% and 95% were prepared by adding purified water to dry

feathers, uniformly mixing the water and feathers, and removing excess water not absorbed by the feathers.

7. Hydrolysis of the hydrated feather raw material samples was performed as follows. In a beaker of inner volume of 500 mL, 150 mL of 0.3 N sodium hydroxide solution was added. Each of wet feather having 5%, 15%, 20%, 80%, 90% and 95% of water content based on 5 g (in terms of the weight of dry feathers) of dry feathers was added thereto, while stirring at a constant rate. Wet feathers were hydrolyzed for 6 hours at 60°C, followed by centrifugation for 30 minutes at 12,000 rpm, and thereby undecomposed residue was recovered. After the undecomposed residue was dried for 18 hours at 80°C, the decomposition rate and the amount of the hydrolysate in the reaction solution were obtained from the weight of the dried-undecomposed residue.

8. As shown by Table 1, selection of feather raw material that has been prehydrated to contain a water content ranging from 20% to 80% significantly increases the decomposition rate and amount of hydrolysate produced. On the other hand, a reduction of water content to 15% or less corresponding to prior art processes using feathers without any hydration, or elevation of water content to 90% or 95% or above, corresponding to prior art processes where feathers are simply immersed or soaked in water, significantly reduced the rate of hydrolysis and hydrolysate produced.

9. Table 1

Water content of feathers	5%	15%	20%	80%	90%	95%
Decomposition rate (%)	46.8	66.4	<b>85.4</b>	<b>83.0</b>	77.8	46.0
The amount of the hydrolysate (%)	1.6	2.2	<b>2.8</b>	<b>2.4</b>	2.0	0.9

10. The increase in decomposition rate reflects the superior hydrolysis of the hydrated raw material and this superior hydrolysis provides a greater yield of keratin. As disclosed in the specification, the more efficient hydrolysis provided by selecting a feather raw material

hydrated to 20% to 80% also provides a keratin hydrolysate having less smell and less undesirable coloration.

11. The undersigned petitioner declares further that all statements made herein of his own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of this application or any patent issuing thereon.

12. Further deponent saith not.

Customer Number

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Yuichi Tsuda  
Signature

August, 16, 2009  
Date